Session 6: Partnership Case Studies

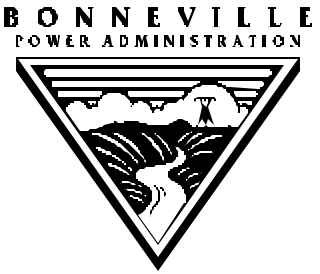
Hybrid Equipment Replacement - Energy Efficiency Project

NOAA - Sand Point Facility

Seattle, WA

Tony Koch, PE, CEM
Bonneville Power Administration (BPA)

Energy 2002 Conference
Palm Springs, CA
June 4, 2002



Background on NOAA Facility

- Gross Acreage: 114 Acres
- Number of Buildings: Nine
- Buildings Square Footage: 600,000 ft^2
- NOAA Staff On-Site: 900 employees
- Activities: Weather Service for PNW, Research Facility (offices and labs), Dive Training Center
- Annual Energy Cost: $420,000 per year

The Facility (overhead)

The Facility

Project Summary

- Initial Energy Audit / Project Scope done by a Super ESPC
- Project Economics did not support Super ESPC implementation
- DOE-SRO request to BPA
  - Perform Reimbursable Project Management
  - Contract All Equipment and Services
  - Coordinate 3rd Party Long Term Financing (20 year term)
- Total Project Capital Cost: $800,000
  - Does not include interest cost
  - Does not discount energy rebate and other contributions

Project Measures

- Replace 8 Rooftop HVAC Units (30-60 ton each)
  - Aging equipment needed replacing
  - Project not solely justified on utility cost savings
  - Overall project Simple Payback ~15 years (prior to rebates)
  - Fuel switch from electric to gas heating on all units
  - VFD on all Supply and Return Air Fans
- Retrofit / Replace ~1,400 Fluorescent Lighting Fixtures
- Install New Natural Gas Distribution Lines
- Replace Electric Water Heater (Kitchen) with Gas Unit
- Install New Electric & Natural Gas Radiant Heaters
  - To replace existing electric convective heating

The Partners

- NOAA: Federal Facility Client
- Raven Services: On-Site O&M Contractor at NOAA
- DOE-SRO: FEMP Perspective & Project Catalyst
- BPA: Project Management & Contracting
- McKinstry: Mechanical General Contractor
- Puget Sound Energy (gas): In-Kind Piping Construction
- Seattle City Light (electric): Electric Energy Savings Rebate
- Third Party Financier: 20 Year Loan (through BPA)

BPA – Project Management, contracts with Mechanical Contractor

Procures lighting fixtures, radiant heaters, and other misc equipment (Gov furnished)

DOE-SRO – Provides initial Project scoping and funding for BPA project management staff cost ($25,000)

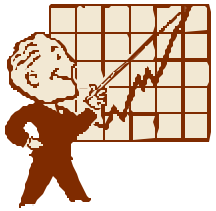
Raven (on site O&M contractor) – Installation of Gov furnished lighting fixtures and on-site overall Field Inspector for the entire project

NOAA - Sand Point Facility, Seattle, WA

McKinstry – Mechanical Contractor, design build HVAC unit installation, installs BPA (Gov) furnished equipment

SCL – Electric Utility Rebate ($66,000), applied as credit in monthly bill, funds are retained in O&M facility budget. HVAC energy savings calculated from new construction City of Seattle energy code as the baseline.

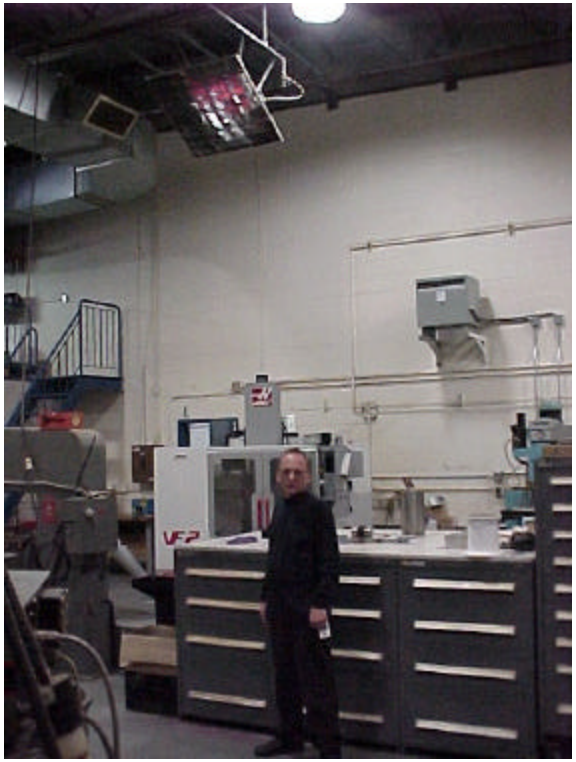
PSE - Provides in-kind gas pipeline extensions within campus, and installs pulse output on four new gas meters



3rd Party Financier - Provides 20 year loan through BPA

HVAC Rooftop Unit Installations

Radiant Heater Unit Installations



Bottom Line Results

- Comprehensive Annual Energy Cost Savings
  - Based on a full post year utility bill analysis, savings are **$53,000 per year**
  - Includes cost savings of heating with gas vs. electric
  - Reflects a ~40% electric rate increase from 2000 to 2001
    - Due to the West Coast Power Crisis
      (high priced electric wholesale energy and low hydro water year)

- Annual Electric Energy Savings
  - ~880,000 kWh/year from Electric Efficiency Measures
    - Additional ~500,000 kWh/year of electricity fuel switched to gas

- Annual New Natural Gas Use
  - ~20,000 Therms/year - Fuel switching from electric to gas